RECREATIONAL SPORT AS A THERAPEUTIC ADJUNCT TO BALNEOTHERAPEUTICAL TREATMENT FOR PATIENTS WITH BACK PAIN

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Original scientific paper
UDC: 796.035:615.828
Received: October 29, 1997
Accepted: December 22, 1999

Abstract:

The effect of Recreational Sport (RS) used as an adjunct to standard balneotherapeutical treatment was studied in 159 patients with back pain. The RS programme led to a significant improvement of the patients' level of physical fitness without aggravating their back pain. These results suggest that RS has a therapeutic value. Therefore it should be made an integral part of rehabilitation programmes for patients suffering from back pain. All the study participants showed a positive attitude to RS. This indicates that RS has a motivational value for physical exercise, which should be exploited also after the end of rehabilitation treatment in spas under the supervision of sports experts and medical doctors.

Key words: recreational sport, sport activity, back pain, balneotherapeutical treatment, physical fitness

ERHOLUNGSSPORTLICHE TÄTIGKEITEN IN DEN KURBÄDERN ALS ZUSÄTZLICHE THERAPIE IN DER BEHANDLUNG DER KRANKEN MIT RÜCKENBESCHWERDEN

Zusammenfassung:

An einer Stichprobe von 159 Kranken mit den schmerzlichen Beschwerden der Wirbelsäule wurde unter derfachmännischen Aufsicht der Erholungssportler und Ärzte, angewandt als zusätzliches Heilmittel in der üblichen Kurbehandlung, die Auswirkung der erholungssportlichen Tätigkeiten untersucht. Die Teilnahme an den erholungssportlichen Programmen brachte bedeutend dem psyhosomatischen Zustand (Fitness) der Kranken bei, wobei keine Verschlechterung des Heilvorgangs oder zusätzliche Rückenleiden ertragen wurden. Auf Grund der betreffenden Ergebnisse dürfte von dem therapeutischen Wert des Erholungssportes (ES) schluss gefolgert werden. Daher empfiehlt der Autor die Einbeziehung vom ES in die Heilbehandlung der Kranken mit Rückenbeschwerden. Alle Teilnehmer an der Untersuchung stimmen dem Erholungssport zu. Die Zustimmung weist auf aussergewöhnlichen Motivationswert des Erholungssportes in der Anregung zur körperlichen Tätigkeiten hin, was unter der fachmännischen Aufsicht von Erholungssportlern und Ärtzten auch nach der abgeschlossenen Kurbehandlung weiter zu folgen wäre.

Schlüsselwörter: Erholungssport, sportliche Tätigkeiten, Rückenbeschwerden, Kurbehandlung, Fitness

Introduction

Back pain is one of the most common reasons for visiting a doctor (Popović, 1989) and a frequent cause for rehabilitation treatment in spas (Vidmar et al., 1985; Wessel, 1974). Back pain is also a frequent reason for reduced physical activity (Commandre et al., 1991). Rehabilitation treatment programmes in spas for these patients include mainly exercises for the back: bathing, electrotherapy and massage (Bernatec, 1982). The consequences of reduced physical activity and improvement of the patient's general physical condition receive less attention (Gusbacher and Rompe, 1988).

Aim of the study

The beneficial effects of Recreational Sports activity (RS), such as enjoyment, a positive influence on physical fitness and health, motivation etc., are well known (Birrer, 1985; Relac, 1974), and some elements of RS have been used with success for therapeutic purposes (Bayer, 1982; Vidmar et al., 1985; Wessel, 1974). In this study, we wished to define the place of RS in the rehabilitation treatment of patients with problems related to the spine.

Patients and methods

The study was performed on a random sample of 159 consecutive patients with a clinical diagnosis of back pain due to ankylosing spondylitis (lumbosacral or cervicobrachial syndrome), admitted to a spa for a three-week course of rehabilitation treatment. The patients were aged from 20 to 60 years, on average 42 years. Group B included 79 patients who received the standard physical treatment for spinal disorders. Group A comprised 80 patients undergoing the same physical treatment as group B, complemented with a programme of

sport activities pursued daily for one hour in the afternoons.

The physical treatment programme for both groups consisted of: exercises in the swimming pool (30 min), exercises in the fitness room (30 min), breathing exercises (15 min), massage and other physical treatment modalities (electrotherapy, fango, ultrasound etc.).

The RS programme comprised sport activities and games designed mainly to promote the processes of transformation of the patient's psychophysical status, thereby improving the locomotor function and physical fitness.

The RS programme included: rapid walking or jogging, ball games, swimming (especially backstroke), cycling, table tennis or tennis, and dancing.

The patients were evaluated at the beginning and at the end of the three-week treatment programme to assess its effects on their basic illness and general physical status. The evaluation comprised tests that measure the functional capacity of the cardiorespiratory and locomotor systems and thus provide an indirect assessment of the status of physical activity. The following parameters were evaluated:

PR - resting pulse rate

BPS, BPD - resting blood pressure - systolic and diastolic (Kilopasqual)

VO_2 - maximal oxygen uptake (ml/kg/min)

VC - vital capacity (milliliters)

FEV_1 - forced expiratory volume in 1st second (millilitres)

FB - forward bending on a bench (centimetres)

SCS - shoulder circle by using a stick (centimetres).

The validity of the tests used had been confirmed in previous studies (Pistotnik, 1991; Pintar, 1976; Šadura et al., 1974).

The basic statistical characteristics were calculated for each variable. Normalcy of distribution was tested by the Kolmogorov-Smirnov procedure. The t-test and univariate analysis of variance were used to assess the significance of differences for individual variables within each group and between the groups at the beginning and at the end of treatment.

Results and discussion

The data presented in Tables 1 and 2 reveal significant improvement in the mobility of the spine, shoulders and hips in both groups at the end of the treatment programme, as compared to the initial status. The beneficial effect of physical treatment on the functional capacity of the locomotor system has been demonstrated in a number of studies (Bayer. 1982; Bernatec, 1982; Rider and Daly, 1991) and so the present results merely confirm those of other authors. The observed improvement in locomotion seems understandable since the physical treatment programme as a whole was designed to achieve this effect.

Table 1: Differences in functional capacity of the locomotor system between the initial and the final evaluation in group A

Parameter	$\bar{X}$ - i	$\bar{X}$ - f	SIG - i	SIG -f	p
FB	14.5	15.5	11.5	12.8	0.000
SCS	126.7	121.9	11.3	10.9	0.002

Table 2: Differences in the functional capacity of the locomotor system between the initial and the final evaluation in group B

Parameter	$\bar{X}$ - i	$\bar{X}$ - f	SIG - i	SIG - f	p
FB	13.6	17.5	10.0	11.5	0.000
SCS	128.1	126.0	14.3	14.0	0.010

At the end of treatment, a significant difference was observed between the two groups with respect to improved shoulder motion in group A. This improvement may be accounted for by the predominance of activities for the shoulders and hips in the RS programme (volleyball, swimming). It should be noted that not a single parameter of functional capacity of the locomotor system showed a significant deterioration on final evaluation.

A striking finding in both groups are the low VO_2 values, which in healthy subjects would indicate a low aerobic capacity even for physically inactive men over 50 years of age. Considering that the average age of our patients was 42 years, the low VO_2 values point to extreme physical inactivity, which was in all likelihood due to the basic illness. The patients probably avoided physical exercise for fear that it could aggravate their back pain.

The values of the parameters of functional capacity of the cardiorespiratory system did not differ significantly between the groups, which was to be expected in view of the patients' similar age.

Tables 6 and 7 demonstrate in both groups, A and B, significant differences in almost all parameters between initial and final evaluation. The functional improvement of cardiorespiratory capacity was manifested by increased maximal oxygen uptake and diminished blood pressure values.

Table 7 demonstrates significant differences in blood pressure and aerobic capacity between group A and group B at the end of treatment. Group A experienced significantly greater functional improvement, manifested by the diminished blood pressure values and increased maximal oxygen uptake. Considering that the RS programme consisted predominantly of

Table 3: Differences in functional capacity of the locomotor system between group A and group B at the end of treatment

Parameter	Group	$\bar{X}$	SIG	MIN	MAX	p
FB	A	19.5	12.8	0.0	46.0	0.296
FB	B	17.5	11.5	0.0	40.0	
SCS	A	121.9	10.9	94.0	143.0	0.040
SCS	B	126.0	14.0	94.0	147.0	

Table 4: Differences in functional capacity of the cardiorespiratory system between group A and group B on initial evaluation

Parameter	Group	$\bar{X}$	SIG	MIN	MAX	p
PR	A	79.8	5.3	64.0	90.0	0.705
PR	B	79.4	6.3	64.0	90.0	
BP-S	A	17.9	1.3	15.3	22.6	0.568
BP-S	B	18.1	1.6	14.6	22.6	
BP-D	A	11.2	0.7	9.3	12.6	0.427
BP-D	B	11.3	0.9	9.3	14.6	
VO2	A	20.1	2.5	15.0	29.0	0.428
VO2	B	20.5	3.2	14.0	27.0	
VC	A	3196.2	668.1	2000.0	4900.0	0.962
VC	B	3191.1	717.2	1900.0	5000.0	
FEV_1	A	2538.7	620.0	1400.0	3900.0	0.834
FEV_1	B	2560.0	703.7	1100.0	4200.0	

Table 5: Differences in functional capacity of the cardiorespiratory system in group B between initial and final evaluation

Parameter	$\bar{X}$ - i	$\bar{X}$ - f	SIG - i	SIG - f	p
PR	79.4	77.6	6.8	6.8	0.002
BPS	18.1	17.9	1.6	1.5	0.000
BPD	11.3	11.3	0.9	0.9	0.760
VO_2	20.5	20.9	3.2	3.4	0.001
VC	3191	3262	717	733	0.001
FEV_1	2560	2627	703	715	0.011

Table 6: Differences in functional capacity of cardiorespiratory system in group A between initial and final evaluation

Parameter	$\bar{X}$ - i	$\bar{X}$ - f	SIG - i	SIG - f	p
PR	79.8	76.3	5.3	5.1	0.001
BPS	17.9	17.4	1.3	1.2	0.000
BPD	11.2	11.0	0.7	0.7	0.001
VO_2	20.1	22.2	2.5	2.7	0.001
VC	3196	3373	668	678	0.003
FEV_1	2538	2636	620	615	0.004

conditioning activities (jogging, swimming, cycling), these results seem logical despite the relatively short duration of the treatment programme. Apparently the daily repetition and intensity of sport activity provided a sufficiently powerful stimulus for the observed transformation of the functional capacity of the cardiorespiratory system. Although aerobic capacity improved in both groups, it remained below normal levels. This indicates that patients who would like to approach a normal state of physical fitness should continue to engage in similar physical activities also after the end of their rehabilitation treatment. Several authors have obtained similar results with the use of RS in healthy subjects. Thus Pintar (1976) observed improvement in aerobic capacity already after a 10-day programme of RS, while Relac (1974) found such improvement after 14 days.

Contrary to our expectations, the final evaluation did not reveal a significant change in the patients' pulse rate values. Nevertheless, the data in Table 7 show a clear tendency for the average pulse rate to decrease in both groups, especially in group A. The finding of a decreased heart rate in 70 patients from group A and in only 54 patients from group B also suggests an appreciable, though statistically insignificant, difference between the two groups.

The lung function values (VC and FEV1) were significantly improved in both groups at the end of treatment, but a significant difference between the groups was not observed.

Finally, we should comment on the observed changes in body weight, which were smaller than expected. Body weight generally plays an important role in pathology of the spine. Neither of the groups showed the expected reduction of the average body weight at the end of the rehabilitation treatment, yet also the average pre-treatment values did not exceed the normal range.

Table 7: Differences in functional capacity of the cardiorespiratory system between group A and group B at the end of treatment

Parameter	Group	$\bar{X}$	SIG	MIN	MAX	p
PR	A	76.3	5.1	64.0	88.0	0.165
PR	B	77.6	6.8	62.0	92.0	
BP-S	A	17.4	1.2	15.3	21.3	0.026
BP-S	B	17.9	1.5	14.6	21.9	
BP-D	A	11.0	0.7	9.3	12.6	0.030
BP-D	B	11.3	0.9	9.3	13.9	
VO2	A	22.2	2.7	17.0	32.0	0.007
VO2	B	20.9	3.4	14.0	28.0	
VC	A	3373.7	678.7	2100.0	5000.0	0.320
VC	B	3262.0	733.6	2000.0	5000.0	
FEV_1	A	2636.2	615.2	1400.0	4000.0	0.963
FEV_1	B	2627.0	715.3	1100.0	4300.0	

Conclusion

Both groups of patients showed, in addition to the reduced parameters of locomotor function, also diminished aerobic capacity below the normal range for their age. This observation indirectly confirms our assumption that patients with back pain are physically less active. The balneotherapeutical programme in spas caused some parameters of functional capacity of the locomotor system to improve, but it did not represent a sufficiently potent stimulus for improvement of the functional capacity of the cardiovascular system. The added programme of RS resulted in further marked improvement of certain parameters of functional capacity of the locomotor system.

Our study has demonstrated that a well-designed RS programme of moderate intensity for patients with back pain does not aggravate their symptoms but is likely to ameliorate the functional capacity of the cardiorespiratory system, which is a key factor in physical fitness. The favourable effect of RS becomes apparent already after a short duration of this activity. However, it is equally rapidly lost once physical activity has stopped.

In conclusion, our results suggest that RS should be made an integral part of any rehabilitation programme for patients with problems related to the spine. Besides having a therapeutic effect, RS is also generally well accepted by the patients, whose physical activity is usually reduced, and provides them with motivation to continue with exercise also at home. The therapeutic effect of RS depends solely on the correct selection of activities and their regular performance under the joint supervision of sports experts and medical doctors.

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